

REMARKS

By this amendment, applicant has amended the specification to correct the reference numerals used on pages 4 - 6 and to make the usage of reference numerals consistent with the amended drawings being submitted herewith. Applicant has also amended the fourth full paragraph on page 5 of the specification to include the disclosure originally provided at page 2, last full paragraph of the specification. Applicant has also amended claims 7 - 9 to correct the dependency thereof and has amended Figures 1 and 2 to correct the usage of reference numerals and show the resilient material on the underside of the disk, as required by the Examiner.

In view of the foregoing amendments to the specification and drawings, reconsideration and withdrawal of the objections to the drawings under 37 CFR 1.83(a) and 1.84(p)(4) are requested.

Claims 1 - 3, 6, 12, 13, 15, 25 and 27 stand rejected under 35 USC 102(b) as allegedly being anticipated by United States Patent No. 5,823,861 to Kobayashi et al (Kobayashi et al '861). Claims 5, 7 - 11, 14, 24 and 26 stand rejected under 35 USC 103(a) as being unpatentable over Kobayashi et al '861. Applicant traverses these rejections and request reconsideration thereof.

The present invention relates to a grinding machine for grinding material by means of grinding bodies. The grinding machine includes a stationary container (2) for receiving grinding material and a rotary disk (3) placed above the container base (2a) for forming a finite gap (5a) with respect to the container wall (2b). In grinding machines of the prior art, a danger exists that the upper and lower parts, particularly the lower part, will be very strongly heated as a result of friction if parts of the grinding material and/or additional added grinding bodies pass during operation into

the gap between the container base and the rotating disk. This, on one hand, leads not only to a relatively short grinding machine service life, but, on the other hand, the machine must be frequently switched off during the working of the grinding material to avoid overheating of both the grinding machine and also the grinding and/or polishing material. See, e.g., the fourth paragraph on page 1 of applicant's specification.

According to the present invention, a finite gap is provided between the rotary disk and the container wall, and the rotary disk has a resilient material at least on its underside. According to this construction, if a grinding body or material particle penetrates the gap between the rotary disk and the container wall, the grinding body or material particle is conveyed outwards solely through the rotary movement between the disk and the container base. No wear occurs as a result of the resilience of the disk, or at least its underside, so that the mounting of the disk is not impaired. See, e.g., the third full paragraph on page 2 of applicant's specification.

In the prior art, the gap between the rotary disk and the wall can be chosen to be ever so small, but still material from the container part enters the area underneath the rotary disk. This material collects there, cakes into a solid and, when the rotary disk turns, rubs against it, on the one hand the expenditure of force for turning the rotary disk is increased, on the other hand, heat is disadvantageously formed.

In order to prevent the aforementioned disadvantages and to avoid any abrasive remaining and caking underneath the disk, the present invention calls for the grinding disk to have on its bottom elastic material or to be formed completely from elastic material. This configuration of at least the bottom, when the rotary disk turns, results in vibratory movements of the bottom which prevent the particles which are located there from sticking and allows the particles moreover, to be conveyed to

the outside again from the middle (by the vibratory motion and by the centrifugal forces acting on the turning disk at the same time) and ultimately conveyed through the gap between the disk and will again upward into the container space. A dynamic equilibrium is established which prevents more and more grinding material from traveling underneath the disk and caking there into a compact solid.

Kobayashi et al '861 discloses a spiral-flow barrel finishing machine, i.e., a grinding machine with a stationary metallic barrel and a rotating barrel inside the stationary barrel for free rotation therein. However, the Kobayashi et al '861 patent fails to disclose a resilient material on the underside of the rotating barrel, i.e., the rotary disk of the application. With respect to cited Figure 2, Kobayashi et al '861 discloses a rotating barrel 6 comprising a cast-iron rotational barrel 4 equipped with a polyurethane lining layer 5 only at the upper part thereof (column 5, lines 49 - 52). Thus, Kobayashi et al '861 does not disclose a resilient covering at least on the underside of the rotary disk, but rather on the upper side of the rotary disk.

Furthermore, noting in Kobayashi et al '861 would have motivated a person skilled in the art to provide a rotating barrel according to Kobayashi et al with a resilient covering on its underside instead of its upper side. The Kobayashi et al '861 patent is entirely concerned with the problem of avoiding blocking of the clearance S between the stationary barrel 3 and the rotating barrel 6 as a result of thermal expansion effects of the lining layers 2, 5 of the stationary and the rotating barrel 3, 6, respectively, the lining layers being provided in order to provide protection of both the stationary and the rotating barrels as well as of articles to be ground during operation of the machine.

In contrast to this, the invention proposes a resilient material at least on the underside of the rotary disk in order to prevent crushing of grinding body particles

passing beneath the disk and for providing a conveying action that effectively transports grinding body particles passing beneath the disk radially outwards without there being any significant wear to the container base or the rotary disk. This particular problem is not addressed in Kobayashi et al '861 and the particular construction of the rotary barrel 6 with rigid lower portion 4 and resilient upper line 5 is not at all suited to solve the problem underlying the present invention.

Accordingly, the presently claimed invention is neither disclosed nor suggested by Kobayashi et al '861.

Claims 16 - 22 stand rejected under 35 USC 103(a) as being unpatentable over Kobayashi et al '861 in view of United States Patent No. 5,088,238 to Lin. Applicant traverses this rejection and requests reconsideration thereof.

The Lin patent has been cited by the Examiner in connection with the placement of the drive motor and the use of a gear set. However, even assuming, arguendo, the Examiner's allegations concerning the Lin patent to be correct, clearly nothing in Lin remedies any of the basic deficiencies noted above with respect to Kobayashi et al '861. Therefore, claims 16 - 22 are patentable over the proposed combination of references.

Claims 23 stands rejected under 35 USC 103(a) as being unpatentable over Kobayashi et al '861 in view of United States Patent No. 5,476,415 to Nishimura et al and United States Patent No. 5,487,696 to Takemoto et al. Applicant traverses this rejection and requests reconsideration thereof.

The Examiner has cited the Nishimura et al and Takemoto et al patents for their teachings in connection with an outlet provided below a rotary plate disk in the base of a container and a sealable outlet, respectively. However, clearly nothing in Nishimura et al and Takemoto et al remedies any of the basic deficiencies noted

above with respect to Kobayashi et al '861. Accordingly, the presently claimed invention is patentable over the proposed combination of references.

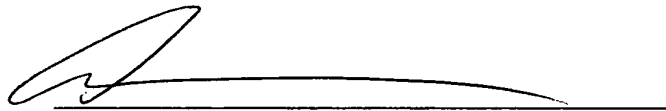
Applicant notes the Examiner has cited a number of documents as being pertinent to applicant's disclosure. However, since these documents were not applied in rejecting claims formerly in the application, further discussion of these documents is deemed unnecessary.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 321.39341X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

A handwritten signature in black ink, appearing to read 'Alan E. Schiavelli', is written over a horizontal line.

Alan E. Schiavelli
Registration No. 32,087

AES/jla
(703) 312-6600
Attachments



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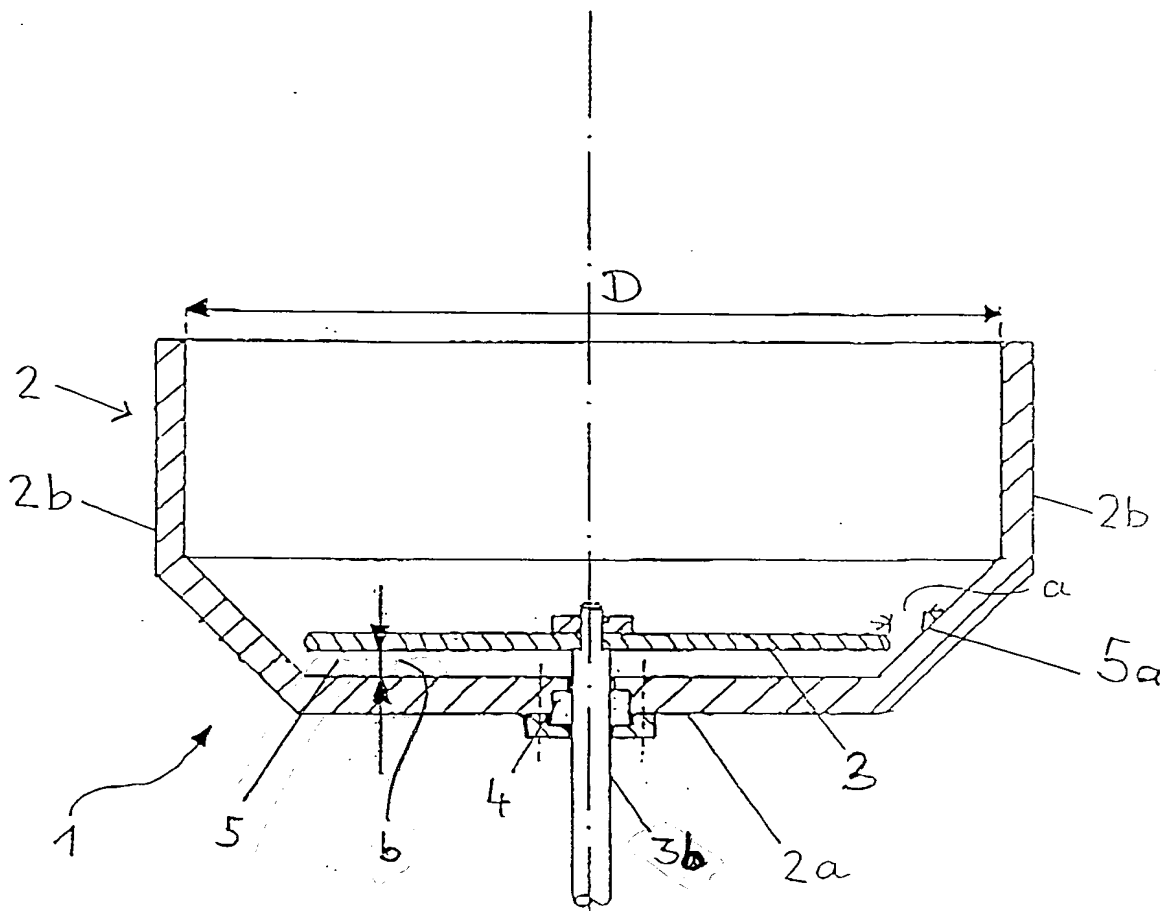


Fig. 1

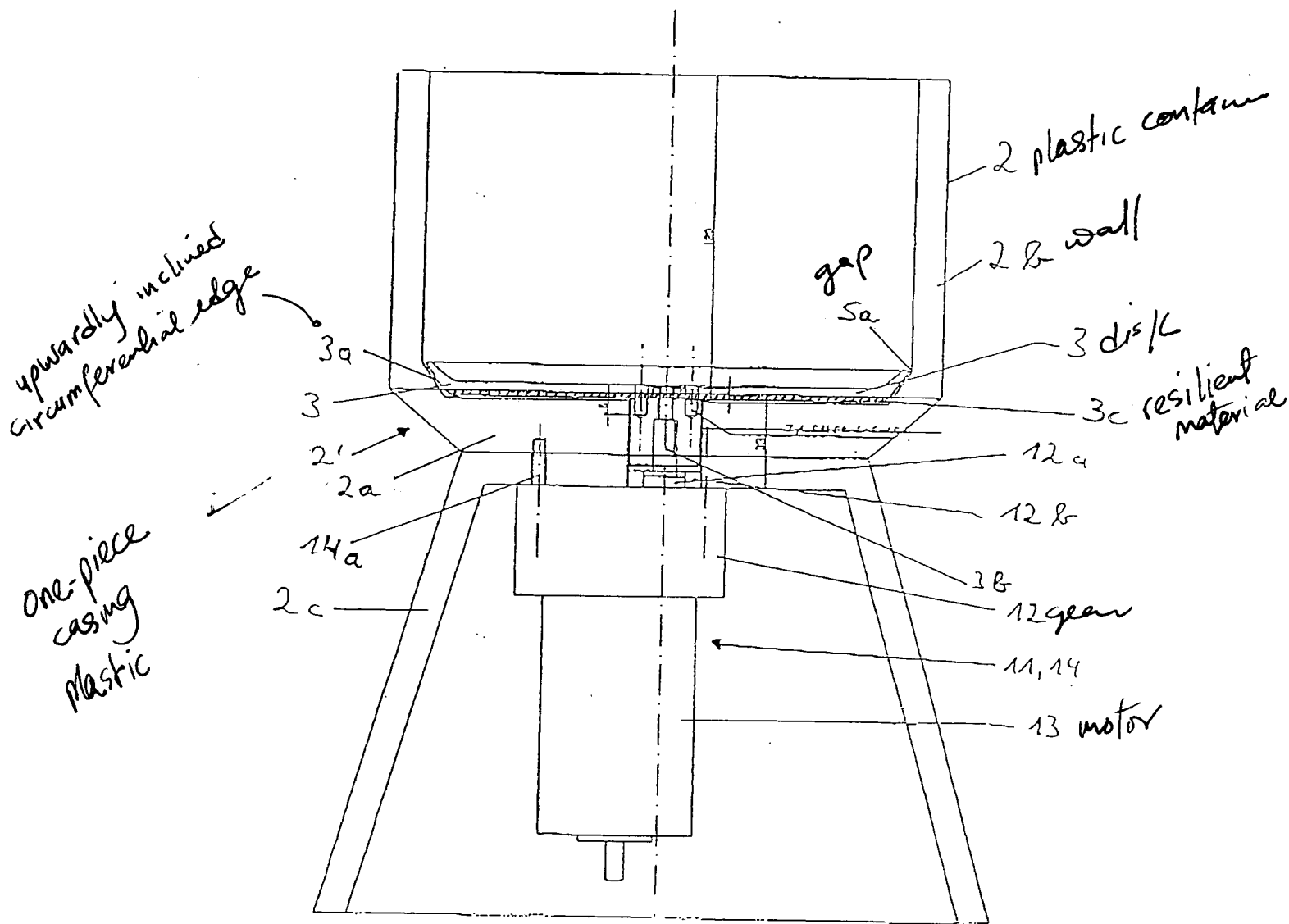
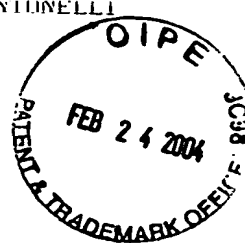


Fig. 2